

**Virginia Electric and Power Company  
North Anna Power Station  
P. O. Box 402  
Mineral, Virginia 23117**

September 28, 2005

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D. C. 20555-0001

Serial No.: 05-535  
NAPS: MPW  
Docket No.: 50-339  
License No.: NPF-7

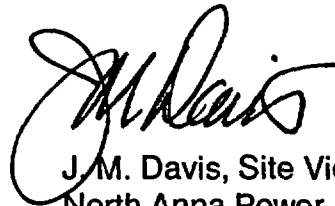
Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Power Station Unit 2.

Report No. 50-339/2005-001-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Management Safety Review Committee for its review.

Sincerely,



J. M. Davis, Site Vice President  
North Anna Power Station

Enclosure

Commitments contained in this letter: None

cc: United States Nuclear Regulatory Commission  
Region II  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, Georgia 30303-8931

Mr. J. T. Reece  
NRC Senior Resident Inspector  
North Anna Power Station



**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0066), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>1. FACILITY NAME</b> NORTH ANNA POWER STATION , UNIT 2	<b>2. DOCKET NUMBER</b> 05000 339	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Automatic Reactor Trip Due to Lightning Strike

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCUMENT NUMBER
08	05	2005	2005	-- 001 --	00	09	28	2005	FACILITY NAME	DOCUMENT NUMBER
										05000
										05000

<b>9. OPERATING MODE</b> 1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>									
	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)			
<b>10. POWER LEVEL</b> 100%	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)			
	20.2203(a)(1)		50.36(c)(1)(i)(A)		X	50.73(a)(2)(iv)(A)		73.71(a)(4)		
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)			50.73(a)(2)(v)(A)		73.71(a)(5)		
	20.2203(a)(2)(ii)		50.36(c)(2)			50.73(a)(2)(v)(B)		OTHER		
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)			50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)			50.73(a)(2)(v)(D)				
	20.2203(a)(2)(v)		50.73(a)(2)(i)(B)			50.73(a)(2)(vii)				
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)			50.73(a)(2)(viii)(A)				
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(B)				

**12. LICENSEE CONTACT FOR THIS LER**

<b>FACILITY NAME</b> J. M. Davis, Site Vice President	<b>TELEPHONE NUMBER (Include Area Code)</b> (540) 894-2101
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>					<b>15. EXPECTED SUBMISSION DATE</b>		
YES (If yes, complete 15. EXPECTED SUBMISSION DATE) X NO					MONTH	DAY	YEAR

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)**

On August 5, 2005, at 2227 hours, North Anna Unit 2 experienced an automatic Reactor trip from 100 percent power during a severe thunderstorm. A lightning strike was the direct cause of this event. The lightning strike caused an Overtemperature Delta T (OTDT) Unit 2 Reactor Trip signal without an actual overtemperature condition. The control room team responded to the reactor trip in accordance with procedure 2-E-0, Reactor Trip or Safety injection. All Engineered Safety Feature equipment responded as designed. A non-emergency 4-hour report was made to the NRC Operations Center at 0020 hours on August 6, 2005, in accordance with 10 CFR 50.72 (b)(2)(iv)(B). An 8-hour report was also made in accordance with 10 CFR 50.72(b)(3)(iv)(A) due to actuation of the Auxiliary Feedwater System (AFW). This event is reportable pursuant to 10 CFR 50.73 (a)(2)(iv)(A) for a condition that resulted in automatic actuation of the reactor protection system and the AFW system. This event posed no significant safety implications since the reactor protection systems functioned to trip the reactor safely. Therefore, the health and safety of the public were not affected by this event.

**LICENSEE EVENT REPORT (LER)  
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NORTH ANNA POWER STATION UNIT 2	05000 - 339	YEAR 2005	SEQUENTIAL NUMBER --001 --	REVISION NUMBER 00	2 OF 4

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

## 1.0 DESCRIPTION OF THE EVENT

On August 5, 2005, at 2227 hours North Anna Unit 2 experienced an automatic Reactor trip from 100 percent power during a severe thunderstorm. A lightning strike was the direct cause of this event. The lightning strike caused an Overtemperature Delta T (OTDT) Unit 2 Reactor Trip signal without an actual overtemperature condition. The reactor trip initiated a turbine trip. The control room team responded to the reactor trip in accordance with procedure 2-E-0, Reactor Trip or Safety injection. All Engineered Safety Feature (EIS System-JE) equipment responded as designed. The post trip response progressed smoothly and within five minutes the Operations crew transitioned to 2-ES-0.1, Reactor Trip without Safety Injection. Initially, Reactor Coolant System (RCS) (EIS System-AB) pressure decreased to approximately 1947 psig and subsequently returned to normal operating pressure. RCS temperature stabilized at approximately 547 degrees F and Pressurizer level stabilized at 31 percent.

Prior to the reactor trip a spike increase on the "A" loop hot-leg and cold-leg temperatures was noted by the Control Room team. The "B" loop cold-leg temperature also spiked. There was no change in "B" loop hot-leg temperature, or in "C" loop temperatures. The spikes lasted for approximately 1.1 seconds before returning to normal operating values. As a result of the spikes, the "A" loop overtemperature delta-T (OTDT) reactor trip setpoint decreased and the "A" loop delta-T increased above the OTDT setpoint. The "B" loop OTDT setpoint decreased. Although the "B" loop delta-T decreased it still exceeded the OTDT reactor trip setpoint. The logic for a OTDT reactor trip is two out of three loops, and the reactor tripped due to "A" and "B" loop delta-T exceeding their respective loop's OTDT reactor trip setpoint. The Unit 2 "C" loop temperature instruments and all three Unit 1 loops were unaffected during this lightning event.

## 2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

This event posed no significant safety implications since the reactor protection functioned to trip the reactor safely. All Engineered Safety Feature equipment responded as designed. Therefore, the health and safety of the public were not affected by this event.

A non-emergency 4-hour report was made to the NRC Operations Center at 0020 hours on August 6, 2005, in accordance with 10 CFR 50.72 (b)(2)(iv)(B). During this call an 8-hour report was also made in accordance with 10 CFR 50.72(b)(3)(iv)(A) due to actuation of the Auxiliary Feedwater System (EIS System-BA). This event is reportable pursuant to 10 CFR 50.73 (a)(2)(iv)(A) for a condition that resulted in automatic actuation of the reactor protection system and the AFW system.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

### 3.0 CAUSE

The lightning strike caused an Overtemperature Delta T (OTDT) Unit 2 Reactor Trip signal without an actual overtemperature condition. The "A" and "B" loop delta-T exceeded their respective loop's OTDT reactor trip setpoint.

Event investigation identified two previous lightning strikes which caused instrumentation spiking on the Unit 2 "A" and "B" loops while not affecting the Unit 2 "C" loop temperature instruments nor any of the three Unit 1 loops. A lightning strike on September 17, 1998, resulted in a Unit 2 automatic reactor trip from the same initiating reactor trip signal. A lightning strike on July 28, 2003, did not result in a unit trip but did result in similar instrumentation fluctuations on one channel.

Although the spurious signals were the result of a lightning strike, inadequate grounding was determined to be the cause of the instrument spikes resulting in the reactor trip. The Unit 2 spare T - hot and T - cold narrow range RTD shields were not grounded at the terminal boards in Protection Cabinets Channel 1 & 2 (2-EI-CB-51 and 2-EI-CB-52). Drawings show that the shield on these spare RTD's should be connected to ground in the process racks.

### 4.0 IMMEDIATE CORRECTIVE ACTION(S)

The Control Room team responded to the reactor trip in accordance with procedure 2-E-0, Reactor Trip or Safety injection. The post trip response progressed smoothly and within five minutes the Control Room team transitioned to 2-ES-0.1, Reactor Trip without Safety Injection.

### 5.0 ADDITIONAL CORRECTIVE ACTIONS

Work Orders were generated to correct improper spare RTD grounds. The remaining T - hot and T - cold RTD shields were checked in both units and were found properly grounded.

All six protection cabinets have been inspected for correct spare RTD ground wire configurations. The only cabinets identified were 02-EI-CB-51 & 52. These were the only channels that exhibited protection channel spikes on their Plant Computer System (PCS) printouts during the lightning strike.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

**6.0 ACTIONS TO PREVENT RECURRENCE**

Installation of the spare RTD grounds should prevent instrumentation spikes causing the OTDT fluctuations.

**7.0 SIMILAR EVENTS**

LER Report No. 50-339/98-004-00, dated October 6, 1998, documents an automatic reactor trip due to a lightning strike. The initiating reactor trip signals were the same for both events.

**8.0 ADDITIONAL INFORMATION**

Unit 1 was not affected by this event.